

WHAT IS CLAIMED IS:

Sub A1
 1. A method of aligning cutting lines of a workpiece, which depend on patterns such as ICs, with a pair of cutting blades provided at a pair of cutting blade units provided with motors for rotating said pair of cutting blades, the alignment being performed when said pair of cutting blade units cuts said workpiece, said alignment method comprising the steps of:

previously registering reference patterns at least one point of low magnification and one point of high magnification on said workpiece located at a preset position;

simultaneously imaging patterns at two points in proximity to the center of said workpiece with two imaging means provided at said pair of cutting blade units, and aligning said workpiece such that the imaged current image patterns at said two points can match with said reference patterns; and

moving either one of said two imaging means to a position so as to image a pattern at one point at the outer circumference of said workpiece and aligning said workpiece such that the imaged current image pattern at the point can match with said reference patterns.

2. A method of aligning cutting lines of a workpiece, which depend on patterns such as ICs, with a pair of cutting blades provided at a pair of cutting blade units provided with motors for rotating said pair of cutting blades, the alignment being performed when said pair of cutting blade units cuts said workpiece, said alignment method comprising the steps of:

previously registering reference patterns at least one point of low magnification and one point of high magnification on said workpiece located at a preset position;

simultaneously imaging patterns at two points in proximity to the center

of said workpiece with two imaging means provided at said pair of cutting blade units, and aligning said workpiece such that the imaged current image patterns at said two points can match with said reference patterns of the low magnification;

moving at least one of said two imaging means to a position so as to image a pattern at one point at the outer circumference of said workpiece to image the pattern and aligning said workpiece such that the imaged current image pattern at the imaged point can match with said reference patterns of the low magnification;

switching the magnification from the low magnification to the high magnification, imaging a pattern at one point at the outer circumference of said workpiece with said one imaging means, and aligning said workpiece so that the imaged current image pattern at point can match with said reference patterns of high magnification; and

rotating said workpiece 90° , imaging a pattern at one point at the outer circumference of said workpiece with said one imaging means, and aligning said workpiece so that the imaged current image pattern at one point can match with said reference patterns of high magnification.

3. An alignment apparatus which aligns cutting lines of a workpiece, which depend on patterns such as ICs, with a pair of cutting blades provided at a pair of cutting blade units provided with motors for rotating said pair of cutting blades, the alignment being performed when said pair of cutting blade units cuts said workpiece, said alignment apparatus comprising:

workpiece mounting means provided with an X-Y direction driving mechanism and a rotational direction driving mechanism;

two imaging means provided at said pair of cutting blade units and imaging patterns on said workpiece mounted on said workpiece mounting means;

storage means in which reference patterns at least at one point of low magnification and one point of high magnification on said workpiece located at a preset position are registered in advance;

pattern matching means for comparing current image patterns from said two imaging means and said reference patterns of the low magnification and the high magnification stored in said storage means and outputting a pattern matching signal; and

control means for driving said workpiece mounting means in accordance with the output of said pattern matching means to align said workpiece at a desired position.

4. The method as defined in claim 1, further comprising the steps of imaging reference patterns of the low magnification and the high magnification on said workpiece with the use of said two imaging means, and previously registering the imaged reference patterns of the low magnification and the high magnification.

5. The method as defined in claim 2, further comprising the steps of imaging reference patterns of the low magnification and the high magnification on said workpiece with the use of said two imaging means, and previously registering the imaged reference patterns of the low magnification and the high magnification.

6. The alignment apparatus defined in claim 3, wherein reference patterns of low magnification and high magnification on said workpiece are imaged by said two imaging means, and the imaged reference patterns of the low magnification and the high magnification are stored in said storage means.

7. The alignment apparatus as defined in claim 3, wherein said alignment apparatus is provided in a ~~duing~~ machine which slices a workpiece into semiconductor wafers with ~~said~~ cutting blade units.